SC186 WG4 RTCA Hdqtrs, August 7–10, 2001
Meeting Minutes

Attendees (WG4-WG1 Meeting):

Jerry Anderson, FAA/AIR-130
Randy Bone, CAASD
Lee Etnyre, UPS AT
Jonathan Hammer, CAASD
Bob Hilb, UPS
Bill Morris, PMA209/Raytheon
Steve Koczo, Rockwell-Collins
Michael Petri, FAA WJH Technical Center
Rip Torn, ALPA
Bernauld Smith, SSA/FAI
Dave Spencer, MIT LL
Ganghuai Wang, MITRE CAASD
John Morgan, Honeywell
Bob Manning, Emergent Info Tech
Greg Stayton, L3 Communications
Gene Wong, FAA/AND-530
Andy Zeitlin, CAASD
Mike Ulrey, Boeing
Paul Gross, Arthur D Little
Gary Livak, FAA
Bill Petruzel, FAA
Rick Stead, ARINC
Richard Barhydt, NASA Langley
Peter Skaves, FAA

WG4 met from Tuesday August 7 to Friday August 10. The Tuesday to noon on Wednesday meeting was held jointly with WG1.

Tuesday AM – August 7 (Joint WG4 – WG1 Meeting)

1. Review of Action Items (WG4/WG1 action item list)

Jonathan led the review of action items list:

- Action #2a - Safety subgroup coordination with WG1: Encourage closer coordination of WG1 members in safety sub-group telecons
- Action #2b - Hazard scenarios: While safety tables are being developed, we need definition of hazard scenarios to go with them. The action item for WG1 is to add the hazard scenarios to the application description documents for each application.

  Bob Hilb asked whether this approach is consistent with the SF21 safety assessment (i.e., Andy Zeitlin's, et. al. effort) and wanted to ensure that we don't duplicate effort. Jerry Anderson was asked if functional safety hazard analyses are being done for each applicant? Jerry indicated that the high-level work is being done in SC-186, and that this is the right approach.
- Action #2c – Feedback on state diagram definitions from WG4 to WG1. This is work in progress.
- Action #2d – Airport Surface Applications Description: Randy Bone has distributed version 3 of ASSA and FAROA. A meeting was held recently at NASA Langley were the applications were discussed. Expect version 4 in ~ 1 month. Currently still lacking scenarios, background section, description of displays. Also no state diagrams yet. Randy is waiting on WG4 feedback on state diagram format.

- It was noted that a Conflict Detection safety analysis is being planned. In addition the status on application descriptions for probing analyses is as follows:
    - Approach Spacing – no work as of late on application description
    - ACM CD&R is started; goal for an input by September.
    - Independent Parallel Approaches (i.e., CSPA) – Greg Stayton provided draft application description.

Jonathan updated the WG4-WQ1 action item list electronically, which is found at the end of these minutes (Table 2).

2. **Review / Update of Work Matrix**

Jonathan reviewed the Work Matrix status on contracts:

- Closely-spaced Parallel Approaches – FAA, Oklahoma City is letting a sole source contract to work this application. Getting close to starting the contract.
- CD&R – Rockwell Collins work to start in September. Michael Petri will develop CD&R state diagram.
- ASSA and FAROA – Rockwell Collins work to start in September.
- Conflict Detection – UPSAT contract is imminent.
- Approach Spacing – An application description draft is expected to be completed by August 30.

It was noted that one can not separate CD, CD&R and CD&Prevention. Bob Hilb questioned how we would move from an Ops Concept to achieve the required surveillance analysis by WG4. Do we want to look at the entire application or just the stressing part. Bob noted that there are two views to ACM, the end state view for both free flight and controlled airspace, and also an intermediate state view. Which one should we address? Greg noted that we should address a state that is worth implementing as an application, i.e., look at the most stressing case. Thus it was noted that we should look at the stressing end state case for free flight, and also consider addressing the application in controlled airspace.

Gene Wong noted that we should build on the NLR / Eby work which addresses the free flight stressing case. It was also noted that the original reason for including the CD&R probe analysis in the first place was to address integrity and availability in a self-separation environment for longer range scenarios.

3. CSPA/AILS Application Description Review – Greg Stayton

Greg provided his draft application description for the CSPA/AILS application and reviewed its contents with the group. Greg noted that more simulations need to be done to reduce runway spacings and referenced the FAA / OK City contract work as planning to address this. After his briefing, Greg sought feedback on what the next steps are in development of this application? He is planning to get some information from NASA to

incorporate into the application description. ***Bob Hilb took the action to contact Bob Buley to get some operational help for Greg (ATC & Pilots).***

Airborne Conflict Detection

Bob Hilb gave a brief review of the Airborne Conflict Detection application description. The latest version is 2.1 (which is almost the same as version 2 provided to WG4). Bob noted that there was some confusion on representative domains in earlier work. He noted that the three domains being addressed are 1) GA traffic pattern, 2) terminal area radar, and 3) enroute (high altitude). Bob noted that the domains are mechanized by how RNP folks have defined these transitions. GA traffic pattern requires the most analysis (nuisance versus missed alarm rates per Table 2 in the application description).

WG4 has the action item to provide feedback to WG1 on the CD application prior to their September meeting.

Jonathan asked if it is time to add Application Descriptions into ASA MASPS? Bob Hilb said yes, but WG1 wants to maintain document control on these application descriptions for now.

Tuesday PM – August 7 (Joint WG4 – WG2 Meeting)

4. TIS-B Presentation by Andy Zeitlin

Working Group 2 (WG2) joined with WG4 to discuss the TIS-B MASPS work. Andy provided an introduction on TIS-B. TIS-B should be viewed as another surveillance source (like ADS-B), with message formats "like" ADS-B. TIS-B is expected to be an incremental development initially intended to support Situational Awareness See-and-Avoid use. Andy noted a number of principles and assumptions that WG2 is following in developing the TIS-B MASPS. He expects RSP/RXX to be defined by WG4, and plans to use NAC/NIC/integrity for TIS-B similar to ADS-B. It is not yet clear what the full set of applications for TIS-B will be.

TIS-B Principles and Assumptions

1) Initial release will provide a gap-filler broadcast service (transitional service when there is not yet full ADS-B equipage)
2) Assumes same data links will be used as for ADS-B
3) Fusion of overlapping targets to simplify the avionics ("choose or fuse" – an aircraft could receive multiple ground site TIS-B reports)
4) "Policy" that TIS-B users must also be transmitting ADS-B. The TIS-B service will not be provided to non-ADS-B equipped aircraft. This is to encourage ADS- B equipage.
5) There will not be a TIS-B up-link report for ADS-B reporting aircraft
6) TIS-B messages will be similar to ADS-B.
7) Expect to provide a unique service volume ID.

Andy overviewed the TIS-B functional diagram description. Andy referenced the "airborne surveillance processing" block and asked whether this should be in TIS-B or in ASA/ASSAP? He noted that some specific requirements were due only to TIS-B. Jonathan indicated that we should follow the document hierarchy that has been established (ASA MASPS above TIS-B MASPS, which is above the ASSAP MOPS).

Andy noted some other aspects of TIS-B including the notion of Service Volumes, multi-link use of TIS-B, ADS-B rebroadcast option, and ground fusion of TIS-B and ADS-B (as a possibility). Is TIS-B as a validation service of ADS-B a desirable utility? – TBD.

Andy indicated a dual approach in the development of the TIS-B MASPS. A top-down approach being followed more Europe that asks "what do we want to use TIS-B for" to determine the requirements on the ground system, and a bottom-up approach (e.g., for see-and-avoid) which is more the approach followed in the US. It was noted that NIC/NAC will be the determining information that enables applications.

The question was asked whether WG4 wants measurement data or track data from TIS-B. What do we lose by going through a tracker? (What does WG4 want? What does WG2 plan to send?). This comes down to correlation versus fusion. It was noted that we should not have both TIS-B and ADS-B data simultaneously. If both occur, it is likely that ADS-B data will be better than TIS-B, and we would select the better data. For a "single" ground site, measured or track data could be provided. For a multi-site ground sensor generally tracker based fusion data is used.

Jonathan noted that TIS-B and TCAS report may be the only fusion case we need to deal with.

Jonathan Brenaise (MIT LL) took the action item to look into TCAS / ATCRBS / TIS-B correlation measurements versus track issues.

5. Presentation on TIS-B NIC/NAC Assignment Method – Raxaneh XXX

Roxinaye (Johns Hopkins) gave a presentation on an approach of using ADS-B received data to calibrate the ground sensor tracks generated by TIS-B over the coverage volume. Use of high quality plots would be used initially for this calibration with use of lower quality plots/tracks if needed (resulting in a subsequent lowering of the NIC/NAC that is uplinked for TIS-B data). Roxinaye noted that elevation provides the largest error, cross range is the next larger error, while range is typically a small error.

6. Required Surveillance Performance (RSP) – Jonathan

Jonathan briefly showed the current RSP parameter definition electronically, e.g., accuracy (tracker lag not included). The question was raised if TIS-B helps NIC? Andy noted that TIS-B is not capable of high update rates and that there is a tradeoff between update rate against the other parameters. Some questions were raised but not resolved: is uplink of primary radar data (with no altitude) via TIS-B useful? Is their a clutter target issue (what kind of clutter problems will ASA /ASSAP face)? TCAS altitude reporting is viewed as the weakest link.

Wednesday AM – August 7 (Resumption of Joint WG4 – WG1 Meeting)

7. Safety Tables – Enhanced Visual Approach

Jonathan projected the Enhanced Visual Approach safety table for discussion. He noted that Hazard Class is the category prior to a mitigation, while equipment criticality accounts for the contributions of mitgation(s). Peter Skaves noted that there are 2 types of hazards; loss of function, i.e., continuity, and undetected misleading information, i.e., integrity, which is typically more severe. Gary Livak asked Peter what role these safety tables have in certification. Peter indicated that they are useful. Bill Petruzel asked how will we use these tables? Jonathan stated that they will be used as part of our fault trees to determine requirements on the system. Jerry Anderson noted that Andy is doing a comparative safety assessment as one of his activities. Rip Torn noted that we want to include environmental factors in our safety tables and analyses.

8. **State Diagrams – Enhanced Visual Approach – Mike Ulrey**

Mike presented a representation of the flow of activities (i.e., a sequence diagram for EVA) developed by Bill Lee, which identifies operational phases. The diagram also captured the ATC and Flight Crew viewpoints (where ATC and Flight Crew are agents). Blocks can be further expanded into activity diagrams for agents. Mike made reference to using a Unified Modeling Language (UML) tool that supports multiple views (sequence diagrams, activity diagrams, object model diagrams), which allows description of complex systems in a graphical way. UML becomes C code that can then be used in simulations of the system.

Mike is planning to develop UML state diagrams as his next task that capture nominal, rare normal and exception cases. Mike believes a multi-view representation which shows flows, interactions between agents and identifies activities (by an agent in a particular phase) is likely needed to capture a particular application for further analysis.

An action item was identified for a subgroup to continue refining this state diagram approach and to review already existing state diagrams to arrive at a common format / representation across all applications (Mike Ulrey, Mike Petri, Randy Bone, Dave Spencer, and Greg Stayton).

Wednesday PM and Thursday AM – August 8-9 (WG4 only meeting)

9. Planned ASSA/FAROA and CD&R Analysis Work – Steve Koczo

In anticipation of pending contract work, Steve provided a kickoff overview of the work tasks to be performed by Rockwell Collins in support of development of the ASA MASPS. Application analysis support will be provided for ASSA / FAROA and CD&R (probe).

Greg raised the concern about each manufacturer doing their own algorithm and the possibility that issues may arise with respect to interoperability. As and example, TCAS CAS algorithms were specified in great detail, while ACM CD&R is currently using a more open (i.e., less specificity) approach. Mike Petri indicated that we can not make a

determination yet to the extent that algorithms will need to be specified. Mike emphasized that algorithms should be compatible among the various applications (CD&R, CSPA/IPA, and ground algorithms).

10. Feedback to SC-159 Concerning PVT Outputs to Support ADS-B

Steve led the group through a discussion of an issue related to augmented position, velocity, time (PVT) outputs for both LAAS and WAAS navigation systems. This issue was documented in a memo by Joel Wichgers. At issue is whether a navigation system should be required to output augmented PVT if augmentation is available. Currently, some proposals are being considered that allow non-augmented PVT output even though augmented precision landing deviations are being provided (e.g., LAAS proposal). The group also reviewed two position papers (one for LAAS and one for WAAS) by Tom Foster that recommend that if available, augmented PVT should be output to support ADS-B.

In response to this discussion, it was noted that this is primarily a market issue, and that vendors will need to implement the appropriate capability as driven by the market. Jerry Anderson also noted that WAAS and LAAS need to specify the options that should be considered (even if they chose not to be implemented).

Jerry Bradley provided additional perspective. He noted there are two types of avionics; wide area MOPS (different from WAAS/LAAS) and DO-229. He indicated that we want 1 type of avionics.

WG4 endorses the positions identified in Tom Foster's WAAS and LAAS position papers to output augmented PVT if available. We should list the applications that cannot be supported if we lack the augmented PVT data.

Action Item – Jonathan to sign on to Tom's letters for WG4 and provide a Chair-to-Chair notification to SC-159 and to get on the "response list".

11. Fault Trees for Enhanced Visual Acquisition – Dave Spencer

Dave provided a review of his fault tree that he is developing for the EVA application. Based on feedback to his initial version of the fault tree, Dave modified his approach to be more EVA-centric. He discussed the various failure events that could lead to an NMAC when 1) EVA has no role, 2) when EVA experiences a failure, and 3) when EVA has deleterious effects on the normal visual-based operation.

Dave raised the issue whether EVA is strictly a CDTI display application or if the application includes use of advisories (e.g., aural beeps, etc). This question must be addressed to WG1.

Based on Dave's material the group entered into a discussion on fault tree faults versus safety benefits. Some members became concerned that we were taking an overly pessimistic view on an application that was intended to provide improved operations. The net result of discussions recognized that both a fault tree, which focuses on identifying potential problems and adverse effects, and a safety benefit study must be

considered. The safety benefit assessment also accounts for the positive contributions that the application provides, i.e., the "saves" that actually prevent or mitigate the occurrence of hazards. Another important point made was that we should be comparing the level of safety provided by an application to the safety offered by today's system in order to identify the net benefit.

It was noted that there should be correlation with the safety table "ASA contributory events" column with Dave's fault tree. Contributory events should occur in the lower portion of the fault tree. If they are not identified in the fault tree, then an inconsistency occurs and it must be resolved to either update the safety table or the fault tree.

12. Fault Tree Programs

Jonathan briefed the group on two fault tree programs that he is evaluating: 1) Relex, and 2) Fault Tree Plus. Relex is offering the tool for half price for RTCA committee work ($3400). ***Mike Ulrey took the action to evaluate the Fault Tree Plus program and report back to the group***. Questions were raised whether the tool handle 1) mutually exclusive events, and 2) highly dependent events. An earlier tool used by some group members (Fault Ease) does not handle these very well.

13. TCPs and Intent Discussion

The group discussed TCPs and intent for ADS-B, i.e., the information content, and the integrity associated with the data. This is also a topic in WG6 for revision A of the ADS-B MASPS. In WG6, it was noted that there is a high degree of complexity associate with TCPs (e.g., speed change points, changes in vertical speed, early VNAV descents, Mach/CAS transitions, turn points, etc). This complexity, and the uncertainty of driving applications is making it difficult to add requirements in the ADS-B MASPS, thus the current view by WG6 is not to write requirements of TCPs and intent into revision A, but to capture all the work in an appendix.

While TCPs and intent will likely not be included as requirements in the ADS-B MASPS revision A, there is still a desire by airlines to keep TCP report requirements in the ADS-B MASPS. There is concern that removing these reports and messages would make it more difficult and costly to add them again later. Thus there is a desire for some form of TCP place holder in the ADS-B MASPS.

The group decided that the information developed by the WG4 Intent Subgroup would be document as an Appendix in the ASA MASPS. In addition, the CD&R application probe analysis should consider including short term intent (but not TCPs) where appropriate.

14. WG-6 Telecon Minutes – Review of Service Levels

Jonathan reviewed the minutes of a telecon with WG6 that addressed Service Levels. The telecon discussed equipage classes and capability codes in the ADS-B MASPS. Equipage classes are already defined and will not be changed for Revision A of the ADS-B MASPS. The discussion focused on the capability classes in the proposal and how these may be revised to incorporate the concept of Service Levels being developed by WG4.

It was noted during discussions that the plan is for Service Levels to be hierarchical, i.e., each subsequent higher level is able to provide the capabilities of the previous levels. It was also noted that we should factor in the application categorization used in the Principles of Operations ASAS document in Service Level definitions (e.g., situational awareness, spacing, delegated separation assurance, self-separation).

Jonathan and Richard Barhydt took the action to coordinate the capability codes with Gary Livak, Jim Maynard and Tom Foster.

Thursday PM –Friday August 9-10 (WG4 Meeting with WG51 Members)

The balance of the Thursday PM and Friday WG4 meeting was a joint meeting with members from EUROCAE WG51. WG4 was pleased to meet with Bob Darby, Eric Hoffman, Karim Zeghal, and Gilbert Caligaris all from EUROCONTROL, and Pierre Gayraud from Thales Avionics. WG51 and WG4 are exploring the possibility of collaborating on joint development of the ASA MASPS.

Bob Darby led the introduction from the WG51 perspective and identified the goal of the two groups to collaborate on brainstorming, deciding how to perform the detailed analyses work, and how to adopt existing methodologies such as ED78A/DO264A for deriving system requirements.

WG51 Comments on ASA MASPS (Version 02.5c June 2001)

Bob provided a handout, which captured comments on the ASA MASPS from WG51. Bob led the review of the individual comments. Some of the more major comments are as follows:

- Detail on applications is sparse. It was noted that a number of application descriptions are in process and will add considerable detail.
- Andy noted that WG4 is planning to perform analysis work that goes to greater depth than anyone else has done to date.
- Safety analysis documents are lacking. Bob indicated that a number of safety analysis documents will become available by October or earlier from EUROCONTROL. ***Action item: Bob to provide WG4 with pertinent safety analysis documents as they become available.***
- Application table (groups of application) and RSP should be a joint discussion item and should be jointly developed and coordinated between WG4 and WG51. It was noted that several organizations are addressing RSP. Bob also noted that ASA MASPS is the primary work effort for WG51.

  Possible areas of joint efforts was identified as addressing 1) Safety, 2) RSP, 3) Service Levels, and 4) OSED / application descriptions.

Review of Application Descriptions

Applications were discussed using the Work Matrix used by WG4. The following connectivity between applications was identified:

- Enhanced Visual Approach Matches SOFREVIA/STNA looking at this

- Enhanced Visual Acquisition — Matches SOFREVIA/STNA looking at this
- ACM / Conflict Detection (mostly GA focus) — No European applications match
- Airport Surface Situational Awareness (ASSA), VMC — NUP applications, nav
- Final Approach & Runway Occupancy Awareness (FAROA)- — No European applications
- Closely Spaced Parallel Approaches (CSPA) Probe — No activity in Europe
- CD&R Probe — European interest
  (two regimes, end-state free-flight ASAS or with ATC; preferred view is for better 2-5 minute planning to avoid conflicts rather than less planning with ASAS)
- Approach Spacing — Definite European interest in this application.
  This is a good area for collaboration (Europe needs full analysis on Approach Spacing; have detailed benefit analysis; there is airline interest in this application; SAS has used a time-based approach in cockpit simulations that worked well)

Other Handouts from WG51

Bob provided additional handouts:

- Operational Service and Environment Description (OSED)
- Station keeping Operational Service, etc (collection of apps descriptions used by WG51 for categorization in PO ASAS document.
- EUROCONTROL ADS Programme Stage 1 – summary of operational case studies
- ED78A/DO264A for ASAS

Joint Work Matrix Discussion

The joint group discussed the columns (deliverables) of the Work Matrix. The Descriptions / Scenarios and State Diagram columns are analogous to the OSED. Bob inquired how the FAA activities (long term investment and program decisions and near term certifications by Safeflight 21) fit with the ASA MASPS effort. It was noted that the level of detail are different, with the FAA taking a broader view with ASA being a more in-depth effort using greater domain expertise and greater focus on ADS-B.

Action Item: WG4 and WG51 to develop a joint Work Matrix (WG51 to draft a version for discussion).

Process Discussion

The joint group discussed a comparison of each respective groups process(es) in developing future ASAS / ASA MASPS requirements.

1) OSED (WG51) comparison to Application Description Outline (WG4)

   The OSED contains two parts 1) description of the environment, including the airspace description (routes, separation standards, services, etc) and traffic characteristics, and 2) description of the service / application. The OSED provides traceability to the environment description (ground infrastructure and aircraft /

vehicles) and makes assumptions on what already exists and what is a new requirement. The table on page 1 in OSED provides a good summary of the various Operational Case Studies (OCSs) that are described in the OSED.

The OSED/OCS describes the scope and objectives, constraints, and the method with and without service. The OCSs provide a mapping between applications and environments (i.e., one can have several applications for one environment, as in F.4.1 on page F-8 in OSED).

Page F-15 provides a table that identifies phases of a procedure / application, which is similar to WG4s state diagrams (which is obtained from an OHA – Operational Hazard Analysis). It shows conditions that trigger the next phase (i.e., a sequence diagram). Andy also noted that the figure on page F-10 provides a nice standard means to depict transfer of responsibility, i.e., a set of standard steps and a consistent way to organize the role for the applications. Mike Ulrey indicated that there is good alignment between the OSED and the diagrams that he and Bill Lee are developing for WG4 state diagram depiction of the applications.

Of all the processes discussed by WG4 and WG51, the comparison of the OSED outline and the Application Description outline are the most divergent. One approach (WG4) takes an application-centric view (across multiple environments), while the other approach (WG51 OSED) takes a more environment-centric view (across multiple applications).

2) Hazard Analysis – Process Comparison

Safety Tables - WG4 has been following the approach to develop a safety table for each application, e.g., the Enhanced Visual Approach Safety Table. It was noted that SOFREVIA / CENA work on STNA for EUROCONTROL is analogous to the WG4 method. Bob indicated that he can share this with us once their documents are ready for release.

Fault Trees – WG4 has also been pursuing a fault trees methodology as part of their process in determining allocations and safety requirements (e.g., integrity, continuity). The joint group reviewed WG51's proposal to use ED78A/DO264A for ASAS for safety analyses. There was very close alignment to the proposed process to the one used by WG4. Some definitions are inconsistent but this can be easily resolved: WG4 will adopt two new definitions proposed by WG51: 1) Operational Consequences will replace WG4s Operational Hazard terminology, and 2) Operational Hazard will replace WG4s Contributory Event terminology in the safety tables.

A Couple More Action Items

Jonathan to start a joint WG4 /WG51 Action Item list.

WG4 / WG51 to identify documents to be exchanged.

October Meeting Schedule

Plans for the October meeting in Brussels are as follows:

October 1 – SC-186 Plenary
October 2 – SC-186 WG1, WG4, EUROCAE WG51 Joint Meeting

October 3 – SC-186 WG4 / EUROCAE WG51 Joint Meeting
October 4 – SC-186 WG4 / EUROCAE WG51 Joint Meeting, Joined by ICAO SCRPS group in PM
October 5 – ICAO meeting continues

Some tentative / preliminary agenda items are:

- ICAO SCRPS / ASA (WG4/WG51) share RSP interest
- WG1 / WG4 / WG51 have shared interest in OSED, state diagrams
- WG4 and WG51 – Template resolution of application descriptions / OSED; terminology / fault trees

Meeting Schedule:

The tentative meeting schedule for joint WG4/WG51 meetings is as follows: Maintain 2 month cycle of WG4 meetings; every other meeting in Washington, DC, every other non DC meeting in Europe. Every third meeting could be joint with WG51-SG3. The net effect is that every other meeting is a joint WG4 /WG51 meeting, resulting in 3 joint meetings a year. E.g., for the next year:

October -- Joint with Eurocae in Europe (Brussels)

December -- at RTCA, not specifically joint

February -- Pheonix, joint

April -- at RTCA, not specifically joint

June -- Joint in Europe

August -- Seattle, not specifically joint

October -- at RTCA, joint

Jonathan noted that all WG4 teleconferences / meetings are open to WG51 participation even if not specifically planned as a joint meeting.

Currently Planned meetings:

EUROCAE WG51 Meetings:
- WG51 SG3 meeting is on Sept 10-11
- WG51 October meeting is with WG4
- WG51 meeting in early/mid November

RTCA SC-186 WG4 meetings
- October 2, 3, 4 in Europe (tentatively in Brussels), preceded by the plenary October 1
- December 10-14 in Washington DC
- February 5-7 (tentatively in Phoenix)

Teleconference schedule:

Aug 22, 11:00-1:00 PM Eastern - WG4 telecon (WG51 invited)
Sept. 5, 11:00-1:00 PM Eastern - WG4 telecon (WG51 invited)
Sept. 19, 10:00-12:00 PM Eastern – Joint WG4 / WG51 telecon (7AM PDT, 10 AM EDT, 4 PM Europe Continent)

WG4 / WG51-SG3 Action Items

Id	Issue	Date Added	Responsible Party	Status / Discussion
08-01-1	Provide WG4 with pertinent safety analysis documents as they become available.	8/01	Bob Darby / WG51	
08-01-2	Draft a joint work matrix for discussion	8/01	WG51	
08-01-3	Identify Documents to be exchanged	8/01	WG51	

Working Group 4 Action Items / Issues Lists

Table 1: ASA MASPS Action Items

	Who	What	Status
1	Steve Koczo, Tony Warren	NIC/NAC integrity discussion in ASA MASPS	Submitted proposal to ADS-B Ad-Hoc committee, awaiting feed back
2	Jonathan / Larry Nivert	Contact Paul Fontaine / Gene Wong to define requirements for Surveillance Data collection activities related to V1 applications.	OPEN
3	Andy Zeitlin	Follow-up to his analysis of RSP for visual applications	Superceded by safety SG CLOSED
4	Stan Jones	Upgrade his diagram of surveillance processing functions	CLOSED
5	Stan Jones,	Enumerate surveillance input options,	OPEN/MASPS Appendix

	Who	What	Status
	Steve Koczo, Tony Warren	characterize NIC/NAC where possible. Identify all reasonable surveillance inputs that we expect and characterize them.	
6	Steve Koczo, Charlie Sloane, Tony Warren, Jim Klein, Bill Petruzel	Characterize various nav sources (RNP) to be used by ADS-B. Enumerate and list the possible RNP sources.	OPEN (some info. Gathered) MASPS Appendix
7	Charlie ? (Mitre) (Jonathan/Andy) Bill Thedford	Provide information on Loran as possible RNP source for ADS-B	Part of Action 6
8	Jonathan Hammer	Edit position paper	Closed
9	Steve Koczo	Develop RNP appendix	Subsumed by Action 6
10	Mike Petri / Jonathan	Find test section author / Talk with Gene Wong	OPEN
11	Jonathan Hammer	Statement of work to Gene Wong	complete
12	Jonathan / Steve	Document WG4 process flow	complete
13	Jonathan Hammer	Contact Rocky/Paul on MASPS process	complete
14	Tony Warren	Slides for plenary on NIC/NAC	complete
15	Jonathan Hammer	Detailed change proposal for NIC/NAC	Subsumed by Action 1
16	Lee Etnyer	Adjust NIC/NAC table to RNP levels	complete
17	Jonathan Hammer	Brief the SC186 Plenary on Dr. Ferrell's presentation	complete
18	Randy Bone (Oct. 3-5,2000 mtg)	Randy to contact Mike Allocco at FAA to get access to the Capstone safety analysis.	complete
19	Safety Subgroup	Safety Subgroup to assimilate the Capstone	complete

	Who	What	Status
	(Jim Klein, Andy Zeitlin)	data in their safety analyses of ADS-B applications	
20	NIC/NAC , new row for RNP table	Tony to coordinate edits with Jonathan	complete
21	Jonathan Hammer	Jonathan took the action to redraw Figure 2-1 of ASA MASPS	complete
22	Steve Koczo	Update writing Section 2.1.1 in ASA MASPS	OBE
23	Tony Warren, Jonathan Hammer	NIC/NAC paper for plenary. Tony to coordinate edits with Jonathan	complete
24	Jim Cieplak	Identify WG1 members to assist WG4's Safety Subgroup in performing safety studies.	Moved to WG1 coordination list
25	WG1 / WG4	Develop Ops Concept document template that adequately describes an application for analysis by WG4	complete
26	WG1 / WG4	Select an application with user community feedback as a stressing application for Version 1 of ASA MASPS.	Complete
27	Larry Nivert	Rewrite 2nd to last paragraph of WG4 position paper.	Complete
28	Jim Klein	GPS antenna location / navigation center: What are requirements for support of surface applications? Contact SC159 to determine definitively	OPEN

	Who	What	Status
		what GPS will provide.	
29	WG4 for WG2	Provide feedback on questions raised by WG2 at 2/2001 meeting on TIS-B (e.g., service volume, validity bit, quality, etc)	complete
30	Jonathan Hammer	SOW for FAA AFS in Oklahoma City for AILS probe analysis	Complete
31	Mike Petri	Check status of AD-hoc issue paper on reference point, a/c dimensions for ADS-B position & report back at next Telecon.	
32	Dave Spencer	Obtain Runway Lights Study reference material for safety/hazard subgroup	Complete
33	Greg Stayton, Gerry McCarter	Develop CSPA State Chart (Caspar)	
34	Mike Petri	Develop ACM / CD State chart	
35	Randy Bone	Develop Surface State Chart	
35	Randy Bone	Develop Surface State Chart	
36	Gene Wong	contact NASA to obtain CSPA application description / ops concept documents (Barry Sullivan – NASA contact)	
37	Gerry McCartor Steve Koczo	Get dates for the task matrix	
38	Mike Ulrey,	Further develop the state diagram	

	Who	What	Status
	Dave Spencer, Greg Stayton and Randy Bone	method using the Approach Spacing and CSPA state diagram as a starting point	
39	Jonathan, Richard Barhydt	coordinate the capability codes with Gary Livak, Jim Maynard and Tom Foster.	
41	WG51	WG51 to draft a work matrix for discussion	

Table 2: WG4-WG1 (Applications) Interchanges / Issues List

	Issue	Date Added	Responsible Party	Status / Discussion
1	Provide Ops Concepts Needs in the format of the "Application Description Outline"	2-06-2001		Living document: Used by WG4 & WG1 to establish the interface between Ops Concepts & RSP rqmts definition
2	Identify WG1 members to assist WG4's Safety Subgroup in performing safety studies	4-3-01		Mark Dill, Chuck Gresham (Possible)

	Issue	Date Added	Responsible Party	Status / Discussion
	Enhanced Visual Acquisition hazard scenario coordination	4-3-01		
	State diagram definition from WG4 to WG1	4-3-01	Michael Ulrey / Dave Spencer / Randy Bone	
	Airport surface scenarios, application description, state diagrams	4-3-01	Bone	
	Conflict detection scenarios & application description / state diagram	4-3-01	WG1 / ACM SG	
	Probing application descriptions	8-07-01	WG1	
	Enhanced Visual Approach Hazard Scenario coordination	4-3-01		
	Bob Hilb to contact Bob Buley to get some operational help for Greg Stayton on AILS (ATC & Pilots).	8-01	Bob Hilb	
3	"AOC" slide update in Ops Concept Needs Template / Doc (Dave Witchey)	2-06-2001		Closed

Table 3: WG4-WG2 (TIS-B) Interchanges / Issues List

	Issue	Date Added	Responsible Party	Status / Discussion
1	TIS-B Scope / Rqmts Questions	2-06-2001 mtg		OPEN

	Issue	Date Added	Responsible Party	Status / Discussion
	TCAS / ATCRBS / TIS-B correlation measurements versus track issues.	8-01	Jonathan Bernaise	
2	How does TIS-B calculate NIC/NAC	4-3-01		OPEN

Table 4: WG4- ADS-B Ad Hoc Group Interchanges / Issues List

	Issue	Date Added	Status / Discussion
1	GPS Antenna Location	4-3-01	OPEN
2	NIC/NAC	4-3-01	OPEN

Table 5: ASSAP MOPS Action Items

	Who	What	Status
1	Stan Jones / Jonathan Hammer	Upgrade his diagram of surveillance processing functions: Consolidate proposed figures and get to Lincoln	OPEN
2	Ann Drumm / Lincoln	Establish surveillance processing requirements	OPEN
3	Jonathan Hammer	Communicate to WG3 ASSAP i/f to 1090 MOPS	OPEN
4	Sethu Rathinam, Jonathan Hammer	Discuss where filter criteria is set – ASSAP or CDTI	OPEN
5	Jonathan Hammer	Add own-ship table for CDTI info.	OPEN
6	Steve Koczo	Coordinate subgroup to address section 2.1.4 of ASSAP MOPS. Research and writing assignments to add material in ASSAP MOPS.	OPEN
7	Andy Zeitlin/WG2	Provide inputs on TIS-B (section 2.1.4.1.3 of ASSAP MOPS)	OPEN
8	Jonathan Hammer Ruy Brandao, UPSAT	Insert RSP table and commentary into ASSAP MOPS	closed
9	Andy Zeitlin, Brandao, Greg Stayton	Develop Section 2.1.4	OPEN

Issues List

ASSAP MOPS ISSUES

	Issue	Date Added	Status / Discussion
1	What track maturity is required	August 8 - 10, 2000	

	Issue	Date Added	Status / Discussion
	before data is sent to ASSAP, from TIS-B, ADS-B, and TCAS? Answers may be system specific.		
2	Usefulness of Measured vs. filtered data.	August 8 - 10, 2000	